

## CLAIMS

What is claimed is:

1. A system for distributed reassembly of a plurality of subdivided packets comprising:
  - 5 a plurality of distributed reassembly components, each of the plurality of distributed reassembly components including one or more data structures for maintaining an indication of the subdivided packets that are stored in other distributed reassembly components of the plurality of distributed reassembly components;
  - a communications mechanism coupled to the plurality of distributed reassembly components to allow communication among the distributed reassembly components; and
  - 10 one or more packet merging mechanisms coupled to the plurality of distributed reassembly components to receive subdivided packets from at least two of the plurality of distributed reassembly components to produce a reassembled packet.
2. The system of claim 1, further comprising a distributor for distributing the
  - 15 stream of packets to the plurality of distributed reassembly components.
3. The system of claim 2, wherein the distributor includes a plurality of paths through a packet switching system.
4. The system of claim 3, wherein at least two of the plurality of path are on different planes of the packet switching system.
- 20 5. The system of claim 1, wherein the communications mechanism includes a communication ring or bus.
6. The system of claim 1, wherein the one or more packet merging mechanisms includes a packet merge bus.
7. A packet switching system including the system of claim 1.

8. A router including the system of claim 1.

9. The system of claim 1, wherein each of the plurality of distributed reassembly components includes a packet reassembler.

10. The system of claim 9, wherein each of the plurality of distributed reassembly components further includes a queue manager.

11. The system of claim 9, wherein each of the plurality of distributed reassembly components further includes a packet memory manager.

12. A system for reassembling a plurality of subdivided packets comprising:  
a plurality of means for reassembling the plurality of subdivided packets, each of  
the plurality of means for reassembling the plurality of subdivided packets including a  
data structure means for indicating which packets of the plurality of subdivided packets  
are located in other of the plurality of means for reassembling the plurality of subdivided  
packets;

a communications means coupled to the plurality of means for reassembling the  
plurality of subdivided packets; and

a merging means for receiving packets from the plurality of means for  
reassembling the plurality of subdivided packets and for producing a reassembling stream  
of the plurality of subdivided packets.

13. The system of claim 12, further comprising a packet switching means, coupled  
to the plurality of means for reassembling the plurality of subdivided packets, for  
distributing packets of the plurality of subdivided packets to the plurality of means for  
reassembling the plurality of subdivided packets.

14. The system of claim 12, wherein each of the means for reassembling the plurality of subdivided packets includes a local data structure means for maintaining an indication of the packets stored locally within a particular means for reassembling the plurality of subdivided packets.

5           15. A method performed by a particular component of a plurality of components for reassembling a larger packet packetized into a plurality of subdivided packets, the method comprising:

          receiving a first set of the plurality of subdivided packets, the first set including a first packet of the plurality of subdivided packets;

10           receiving an indication of a second set of the plurality of subdivided packets received by a second component of the plurality of components, the indication of the second set identifying at least a second packet of the plurality of subdivided packets; and

          sending the first packet over a communications media in coordination with at least one other component of the plurality of components of which the second component is a  
15           member to generate the larger packet including the first and second subdivided packets.

          16. The method of claim 15, further comprising placing a reassembled packet indication in a queue, the reassembled packet indication including a representation of the first packet; and removing the reassembled packet indication from the queue.

20           17. The method of claim 16, wherein the reassembled packet indication further includes a second representation of the second packet.

          18. The method of claim 16, wherein the first packet is the first in the reassembly order of the smaller packets.

          19. The method of claim 15, wherein the first packet is not the first in the reassembly order of the smaller packets.

20. The method of claim 15, further comprising receiving a transmit request from the second component, wherein sending the first packet is performed in response to receiving the transmit request.

21. The method of claim 15, further comprising in response to recognizing the first packet is the first in the reassembly order of the smaller packets, sending a transmit request to at least the second component of the plurality of components.

22. The method of claim 15, wherein the indication of the second set of packets is received over a communications ring or bus.

23. The method of claim 15, wherein each of the packets of the plurality of subdivided packets is identified with a sequence identifier.

24. The method of claim 23, wherein the sequence identifier is a sequence number or a timestamp value.

26. The method of claim 15, further comprising storing the first packet on a storage device or in a memory; and retrieving the first packet from the storage device or the memory.

27. A packet switching system performing the method of claim 15.

28. A router performing the method of claim 15.

29. A computer system performing the method of claim 15.